K L Deemed to be University
Department of Computer Science and Engineering-Honors -- KLVZA
Course Handout
2023-2024, Odd Sem

Course Title	:OBJECT ORIENTED PROGRAMMING
Course Code	:23CS5101
L-T-P-S Structure	: 2-0-2-4
Pre-requisite	:
Credits	: 4
Course Coordinator	:Mohsin Fayaz Khanday
Team of Instructors	:
Teaching Associates	:

Syllabus : Introduction: Basic concepts of Java, Fundamentals of Java, Object-Oriented Programming, OOP Principles, Encapsulation, Inheritance and Polymorphism, Java as an OOP, Internet Enabled language, The Byte code, Data types, Variables, Arrays, Operators, Control Statements, Type Conversion and Casting. Classes and Objects: Concepts of classes and objects, declaring objects, Assigning Object Reference Variables, Methods, Constructors, Access Control, Overloading methods. Inheritance: Inheritance: Inheritance Basics, member access rules, Usage of super and final keyword, forms of inheritance, Method Overriding, Access Modifiers. Abstract Classes, Packages and Interfaces: Packages, Classpath, importing packages, differences between classes and Interfaces, Implementing and applying Interface. Exception Handling: Exception Handling Fundamentals. Multi-threading & Parallel Programming: Introduction to Multithreading and Parallel Programming, Thread Concepts & its States, Creating Tasks and threads, Thread Classes, Thread Pools, Thread Synchronization, Cooperation among Threads. JDBC: API, Components, Architecture (2 Tier & 3 Tier), Divers & Its Types, Packages for JDBC Connection, Steps to connect to Databases.

Text Books : Herbert Schildt, “The Complete Reference Java”, 7th edition TMH. Timothy A. Budd, “An Introduction to Object-Oriented Programming”, 3/e, Pearson, 2008.

Reference Books : Deitel & Deitel, “‘Java – How to program”, 6th edition, PHI, 2007 Cay. S.Horstmann and Gary Cornell “Core Java 2, Vol 1, Fundamentals”, Seventh Edition, Pearson Education.

Web Links : https://java.com/download (java software) 2. http://docs.oracle.com/javase/tutorial/java/TOC.html (material source) 3. http://www.tutorialspoint.com/java/ (material source) 4. www.javatpoint.com/corejava-interviewquestions (interview questions source)

MOOCS : Udemy-https://www.udemy.com/object-oriented-programming-oops-concepts-in-english/

Course Rationale : The course takes an imperative view of problem-solving using Java programming language. This necessitates a firm foundation on the principles of Object-Oriented Programming (OOP). Student is professionally trained in OOP principles. The students are made to write Java programs on their own for sets of both mathematical and other engineering problems after exposing them to the different constructs of Java language namely inheritance, abstract classes, Interfaces, packages, and multithreading. Finally, the student is acquainted with Parallel programming and JDBC.

Course Objectives : The objective of the course is to equip the student with problem solving skills using Object Oriented Programming language – Java and details about the essential ingredients of the programming language and its fundamentals with a rich set of examples.

COURSE OUTCOMES (COs):

CO NO	Course Outcome (CO)	PO/PSO	Blooms Taxonomy Level (BTL)
CO1	Understand and apply basic concepts of Java, and fundamentals of Java.	PO1,PO2	3
CO2	Apply the concepts of classes, objects, Inheritance, method overriding, and overloading	PO5,PO2	3
CO3	Analyze the concepts of abstract class, packages, interfaces, and exception handling	PO2,PO5	4
CO4	Analyze the concepts of Multi-threading, Parallel Programming, and JDBC.	PO2,PO5	4
CO5	Apply the various OOPs concepts to solve any real-world problems.	PO2,PO5	4
CO6	Skilling on Advanced OOPs concepts	PO5,PO2	4

COURSE OUTCOME INDICATORS (COIs)::

Outcome No.	Highest BTL	COI-1	COI-2	COI-3	COI-4	COI-5	COI-6
CO1	3	**Btl-3** Achieve proficiency in writing platform-independent Java code, utilizing data types, variables, arrays, operators, control statements, and understanding the important concepts underlying these elements.					
CO2	3		**Btl-3** Master the creation and implementation of Java programs utilizing classes, objects, methods, constructors, and access control and apply inheritance, method overriding, and access modifiers effectively to create and extend Java classes.				
CO3	4			**Btl-4** Attain expertise in abstract class implementation, effective code organization using packages, and precise interface utilization. Demonstrate proficiency in exception handling, including the creation of custom exception classes and understanding exception propagation.			

CO4	4				**Btl-4** Attain expertise in multithreading, parallel programming, and JDBC for effective application concurrency and seamless database connectivity.		
CO5	4					**Btl-4** Demonstrate the ability to effectively apply Object-Oriented Programming (OOP) concepts, including class design, inheritance, encapsulation, and abstraction, to develop practical solutions for real-world problems.	
CO6	4						**Btl-4** Demonstrate proficiency in applying advanced Object-Oriented Programming (OOP) concepts to design and implement sophisticated solutions for real-world problems.

PROGRAM OUTCOMES & PROGRAM SPECIFIC OUTCOMES (POs/PSOs)

Po No.	Program Outcome
PO1	Apply the knowledge of computer engineering principles and paradigms in the design of system components and processes that meet the specific needs of the industry.
PO2	Identify, analyze and formulate solutions to complex engineering problems using innovative and emerging technologies.
PO3	Effectively communicate technical information in speech, presentation and documentation.
PO4	Extract information relevant to novel problems and apply appropriate research methodology to develop scientific knowledge.
PO5	Self-learn and pursue higher studies to upgrade qualifications and attain constructive growth in profession.
PO6	Make valuable contributions to design, developer by practicing related engineering applications and algorithmic methods.
PO7	Provide exposure to latest tools and technologies based on the industry needs and contribute to valuable research findings in the specialized domains.

Lecture Course DELIVERY Plan:

Sess.No.	CO	COI	Topic	Book No[CH No][Page No]	Teaching-Learning Methods	EvaluationComponents
1	CO1	COI-1	Course handout: Regarding Syllabus, Textbooks, References, MOOC's, Evaluation Pattern, Division of course Competencies. Introduction/Recap of Procedural Oriented Programming Introduction to basic concepts of Java	T1:1-3	PPT,Talk	ALM,End Semester Exam,Home Assignment,MOOCs Review,SEM-EXAM1
2	CO1	COI-1	Introduction to Object-Oriented Paradigm-Principles, Bytecode. Differences between Procedure oriented & Object Oriented Programming	T1: 2 -22T1: 3 -33	PPT,Talk	ALM,End Semester Exam,Home Assignment,MOOCs Review,SEM-EXAM1
3	CO1	COI-1	Principles of Encapsulation, Inheritance, and Polymorphism. Importance of data hiding and abstraction	T1: 8-157	PPT,Talk	ALM,End Semester Exam,Home Assignment,MOOCs Review,SEM-EXAM1
4	CO1	COI-1	Java's role as an internet-enabled programming language. Bytecode and its execution by the Java Virtual Machine (JVM)	T1: 13-285	PPT,Talk	ALM,End Semester Exam,Home Assignment,MOOCs Review,SEM-EXAM1
5	CO1	COI-1	In-depth coverage of primitive and reference data types. Detailed explanation of variable declaration, initialization, and variable scopes (local, instance, and class).	T1: 4-70	PPT,Talk	ALM,End Semester Exam,Home Assignment,MOOCs Review,SEM-EXAM1
6	CO1	COI-1	A thorough examination of arrays as data structures and various operators, including arithmetic, relational, and logical operators.	T1: 3-48T1: 7-125,143	PPT,Talk	ALM,End Semester Exam,Home Assignment,MOOCs Review,SEM-EXAM1
7	CO1	COI-1	Explore control statements such as if, else, switch, for, and while for effective program flow control. Understand conditional and iterative execution.	T1: 5-77	PPT,Talk	ALM,End Semester Exam,Home Assignment,MOOCs Review,SEM-EXAM1
8	CO1	COI-1	Investigate automatic and explicit type conversion in Java. Examine the process of casting data from one type to another,	T1: 3 -45	PPT,Talk	ALM,End Semester Exam,Home Assignment,MOOCs Review,SEM-EXAM1
9	CO2	COI-2	Explore object creation using the new keyword and managing object reference variables.	T1: 6-105	PPT,Talk	ALM,End Semester Exam,Home Assignment,MOOCs Review,SEM-EXAM1

Sess.No.	CO	COI	Topic	Book No[CH No][Page No]	Teaching-Learning Methods	EvaluationComponents
10	CO2	COI-2	Detailed explanation of method creation, parameter passing, and constructor usage.	T1: 8-157	PPT,Talk	ALM,End Semester Exam,Home Assignment,MOOCs Review,SEM-EXAM1
11	CO2	COI-2	Usage of static data, static methods.	T1: 7-143	PPT,Talk	ALM,End Semester Exam,Home Assignment,MOOCs Review,SEM-EXAM1
12	CO2	COI-2	Usage of Method Overloading and Garbage Collection in Java	T1: 8-174	PPT,Talk	ALM,End Semester Exam,Home Assignment,MOOCs Review,SEM-EXAM1
13	CO2	COI-2	Nested Classes in Java	T1: 8-171	PPT,Talk	ALM,End Semester Exam,Home Assignment,MOOCs Review,SEM-EXAM1
14	CO2	COI-2	A comprehensive study of inheritance, including the transfer of attributes and behaviors from a superclass to a subclass. Explore access modifiers (public, private, protected, and default)	T1: 8-180	PPT,Talk	ALM,End Semester Exam,Home Assignment,MOOCs Review,SEM-EXAM1
15	CO2	COI-2	Discuss single, multiple (via interfaces), and hierarchical inheritance.	T1: 9-202	PPT,Talk	ALM,End Semester Exam,Home Assignment,MOOCs Review,SEM-EXAM1
16	CO2	COI-2	Method Overriding; usage of Super, this key words	T1: 8-174	PPT,Talk	ALM,End Semester Exam,Home Assignment,MOOCs Review,SEM-EXAM1
17	CO2	COI-2	Explore the use of the final keyword to prevent further inheritance and method overriding.	T1: 8-183	PPT,Talk	ALM,End Semester Exam,Home Assignment,MOOCs Review,SEM-EXAM1
18	CO3	COI-3	Understand abstract classes, and how to create abstract classes and extend them in subclass implementations.	T1: 10-214	PPT,Talk	ALM,End Semester Exam,MOOCs Review,SEM-EXAM2
19	CO3	COI-3	User defined Packages, class path and access protection	T1: 10-214	PPT,Talk	ALM,End Semester Exam,Home Assignment,MOOCs Review,SEM-EXAM2
20	CO3	COI-3	In-depth analysis of classes providing concrete implementations and interfaces defining method signatures.	T1:183-200	PPT,Talk	ALM,End Semester Exam,Home Assignment,MOOCs Review,SEM-EXAM2
21	CO3	COI-3	Practical examples of implementing multiple interfaces and adhering to contract specifications.	T1:205-220	PPT,Talk	ALM,End Semester Exam,Home Assignment,MOOCs Review,SEM-EXAM2

Sess.No.	CO	COI	Topic	Book No[CH No][Page No]	Teaching-Learning Methods	EvaluationComponents
22	CO3	COI-3	Fundamentals of exception handling. Understand the distinction between checked and unchecked exceptions and how to handle them.	T1:205-220	PPT,Talk	ALM,End Semester Exam,Home Assignment,MOOCs Review,SEM-EXAM2
23	CO3	COI-3	Create custom exception classes to handle application-specific errors. Explore how exceptions propagate through method calls and exception chaining.	T1: 13-293	PPT,Talk	ALM,End Semester Exam,Home Assignment,MOOCs Review,SEM-EXAM2
24	CO4	COI-4	Introduction to Multithreading, Runnable interface, Thread class. Explore thread creation, lifecycle, and synchronization.	T1: 11-228	PPT,Talk	ALM,End Semester Exam,Home Assignment,MOOCs Review,SEM-EXAM2
25	CO4	COI-4	Implement multithreading using Java's Thread class and Runnable interface.	T1: 11-228	PPT,Talk	ALM,End Semester Exam,Home Assignment,MOOCs Review,SEM-EXAM2
26	CO4	COI-4	Introduction to the JDBC API and its role in database access.	T1:617-623	PPT,Talk	ALM,End Semester Exam,Home Assignment,MOOCs Review,SEM-EXAM2
27	CO4	COI-4	Components and architecture of JDBC, including 2-tier and 3-tier architectures.	T1: 701-716	PPT,Talk	ALM,End Semester Exam,Home Assignment,MOOCs Review,SEM-EXAM2
28	CO4	COI-4	Explore different JDBC drivers, such as Type 1, Type 2, Type 3, and Type 4.	T1: 701-716	PPT,Talk	ALM,End Semester Exam,Home Assignment,MOOCs Review,SEM-EXAM2
29	CO4	COI-4	Step-by-step guide on connecting Java applications to databases using JDBC, including creating statements and executing queries.	T1: 13-293	PPT,Talk	ALM,End Semester Exam,Home Assignment,MOOCs Review,SEM-EXAM2
30	CO4	COI-4	Step-by-step guide on connecting Java applications to databases using JDBC, including creating statements and executing queries.	T1: 13-293	PPT,Talk	ALM,End Semester Exam,Home Assignment,MOOCs Review,SEM-EXAM2

Lecture Session wise Teaching – Learning Plan

SESSION NUMBER : 1

Session Outcome: 1 Understand the fundamental concepts of Java programming.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods

10	Course handout: Regarding Syllabus, Textbooks, References, MOOC's, Evaluation Pattern, Division of course Competencies.	1	Talk	--- NOT APPLICABLE ---
20	Introduction/Recap of Procedural Oriented Programming	2	PPT	--- NOT APPLICABLE ---
20	Introduction to basic concepts of Java	2	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 2

Session Outcome: 1 Understand the core principles of Object-Oriented Programming and discern the key distinctions between Procedure-oriented and Object-Oriented Programming.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
10	Recap/Attendance	1	Talk	--- NOT APPLICABLE ---
20	Introduction to Object-Oriented Paradigm-Principles, Bytecode.	2	PPT	--- NOT APPLICABLE ---
20	Differences between Procedure Oriented & Object Oriented Programming	2	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 3

Session Outcome: 1 Apply Encapsulation, Inheritance, and Polymorphism principles effectively. Recognize the importance of data hiding and abstraction in enhancing code quality.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
10	Recap/Attendance	1	Talk	--- NOT APPLICABLE ---
20	Principles of Encapsulation, Inheritance, and Polymorphism	3	PPT	--- NOT APPLICABLE ---
20	Importance of data hiding and abstraction	3	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 4

Session Outcome: 1 Comprehend Java's internet-enabled nature and grasp bytecode execution by the JVM for platform-independent programming.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
10	Recap/Attendance	1	Talk	--- NOT APPLICABLE ---
20	Java's role as an internet-enabled programming language.	2	PPT	--- NOT APPLICABLE ---

20	Bytecode and its execution by the Java Virtual Machine (JVM)	3	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 5

Session Outcome: 1 Develop a comprehensive understanding of primitive and reference data types, including int, double, and String, exploring their practical usage and memory representation.

Session Outcome: 2 Proficiently handle variable declaration, initialization, and understand variable scopes (local, instance, class) for precise data control in Java programs.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
10	Recap/Attendance	1	Talk	--- NOT APPLICABLE ---
20	In-depth coverage of primitive and reference data types such as int, double, and String. Explore their usage and memory representation.	3	PPT	--- NOT APPLICABLE ---
20	Detailed explanation of variable declaration, initialization, and variable scopes (local, instance, and class).	3	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 6

Session Outcome: 1 Comprehensive understanding of arrays as data structures, operators, including arithmetic, relational, and logical operators, for effective problem-solving in programming.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
10	Recap/Attendance	1	Talk	--- NOT APPLICABLE ---
40	A thorough examination of arrays as data structures and various operators, including arithmetic, relational, and logical operators.	3	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 7

Session Outcome: 1 Explore control statements like if, else, switch, for, and while for efficient program flow management

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
10	Recap/Attendance	1	Talk	--- NOT APPLICABLE ---
20	Explore control statements such as if, else, switch, for, and while for effective program flow control.	3	PPT	--- NOT APPLICABLE ---
20	Conditional and iterative execution.	3	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 8

Session Outcome: 1 Thorough understanding of automatic and explicit type conversion in Java

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods

10	Recap/Attendance	1	Talk	--- NOT APPLICABLE ---
20	Investigate automatic and explicit type conversion in Java, including widening and narrowing conversions.	3	PPT	--- NOT APPLICABLE ---
10	Examine the process of casting data from one type to another, including upcasting and downcasting.	3	PPT	--- NOT APPLICABLE ---
10	Precedence rules and Associativity, Primitive Type Conversion and Casting	3	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 9

Session Outcome: 1 Achieve proficiency in Java's automatic and explicit type conversion, encompassing widening, narrowing conversions, and data casting (upcasting and downcasting).

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
10	Recap/Attendance	1	Talk	--- NOT APPLICABLE ---
20	Explore object creation using the new keyword and managing object reference variables.	3	PPT	--- NOT APPLICABLE ---
20	Detailed explanation of method creation, parameter passing, and constructor usage.	3	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 10

Session Outcome: 1 Gain a comprehensive understanding of method creation, parameter passing, and constructor usage, with a focus on practical application.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
10	Recap/Attendance	1	Talk	--- NOT APPLICABLE ---
40	Detailed explanation of method creation, parameter passing, and constructor usage.	4	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 11

Session Outcome: 1 Provides a solid understanding of static data, static methods, and the effective utilization of the "final" keyword with data in programming contexts.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Recap/Attendance	1	Talk	--- NOT APPLICABLE ---
45	Usage of static data, static methods, usage of final with data	3	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 12

Session Outcome: 1 Proficiency in Method Overloading and understanding of Garbage Collection in Java.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Recap/Attendance	1	Talk	--- NOT APPLICABLE ---
45	Usage of Method Overloading and Garbage Collection in Java	3	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 13

Session Outcome: 1 Explain what is nested class and show example. rewrite in a professional way

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Recap/Attendance	1	Talk	--- NOT APPLICABLE ---
45	Nested Classes in Java	3	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 14

Session Outcome: 1 Understanding superclass-to-subclass attribute transfer and access modifiers' roles.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Recap/Attendance	1	Talk	--- NOT APPLICABLE ---
45	A comprehensive study of inheritance, including the transfer of attributes and behaviors from a superclass to a subclass. Explore access modifiers (public, private, protected, and default)	3	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 15

Session Outcome: 1 Exploration of Single, Multiple (through Interfaces), and Hierarchical Inheritance.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Recap/Attendance	1	Talk	--- NOT APPLICABLE ---
45	Discuss single, multiple (via interfaces), and hierarchical inheritance.	3	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 16

Session Outcome: 1 Adequate understanding of Method Overriding and skillful usage of "super" and "this" keywords.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Recap/Attendance	1	Talk	--- NOT APPLICABLE ---

45	Method Overriding; usage of Super, this key words	3	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 17

Session Outcome: 1 Investigate the application of the "final" keyword to restrict further inheritance and prevent method overriding.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Recap/Attendance	1	Talk	--- NOT APPLICABLE ---
45	Explore the use of the final keyword to prevent further inheritance and method overriding.	3	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 18

Session Outcome: 1 Enables a comprehensive grasp of abstract classes and their implementation in subclass scenarios for practical software development.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Recap/Attendance	1	Talk	--- NOT APPLICABLE ---
45	Understand abstract classes, and how to create abstract classes and extend them in subclass implementations.	4	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 19

Session Outcome: 1 Equips individuals with expertise in user-defined packages, class path configuration, and access protection for practical software development purposes.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Recap/Attendance	1	Talk	--- NOT APPLICABLE ---
45	User defined Packages, class path and access protection	4	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 20

Session Outcome: 1 Understand how classes provide concrete implementations and interfaces defining method signatures.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Recap/Attendance	1	Talk	--- NOT APPLICABLE ---
45	In-depth analysis of classes providing concrete implementations and interfaces defining method signatures.	4	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 21

Session Outcome: 1 Provides practical proficiency in implementing multiple interfaces and adhering to contract specifications through real-world examples

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Recap/Attendance	1	Talk	--- NOT APPLICABLE ---
45	Practical examples of implementing multiple interfaces and adhering to contract specifications.	4	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 22

Session Outcome: 1 Empowers learners to grasp the essentials of exception handling

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Recap/Attendance	1	Talk	--- NOT APPLICABLE ---
45	Learn the fundamentals of exception handling, including the try-catch block, throw, throws, and finally. Understand the distinction between checked and unchecked exceptions and how to handle them.	4	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 23

Session Outcome: 1 Understanding exception propagation, and effective error handling in software development.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Recap/Attendance	1	Talk	--- NOT APPLICABLE ---
45	Create custom exception classes to handle application-specific errors. Explore how exceptions propagate through method calls and exception chaining.	4	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 24

Session Outcome: 1 Multithreading concepts.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Recap/Attendance	1	Talk	--- NOT APPLICABLE ---
45	Introduction to Multithreading, Runnable interface, Thread class. Explore thread creation, lifecycle, and synchronization.	4	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 25

Session Outcome: 1 Implement multithreading

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods

5	Recap/Attendance	1	Talk	--- NOT APPLICABLE ---
45	Implement multithreading using Java's Thread class and Runnable interface.	4	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 26

Session Outcome: 1 Understanding the role of JDBC in database operations

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Recap/Attendance	1	Talk	--- NOT APPLICABLE ---
45	Introduction to the JDBC API and its role in database access.	4	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 27

Session Outcome: 1 Components and architecture of JDBC

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Recap/Attendance	1	Talk	--- NOT APPLICABLE ---
45	Components and architecture of JDBC, including 2-tier and 3-tier architectures.	4	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 28

Session Outcome: 1 JDBC Drivers

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Recap/Attendance	1	Talk	--- NOT APPLICABLE ---
45	Explore different JDBC drivers, such as Type 1, Type 2, Type 3, and Type 4.	4	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 29

Session Outcome: 1 JDBC Operations

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Recap/Attendance	1	Talk	--- NOT APPLICABLE ---
45	Step-by-step guide on connecting Java applications to databases using JDBC, including creating statements and executing queries.	4	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 30

Session Outcome: 1 JDBC Operations

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Recap/Attendance	1	Talk	--- NOT APPLICABLE ---
45	Step-by-step guide on connecting Java applications to databases using JDBC, including creating statements and executing queries.	4	PPT	--- NOT APPLICABLE ---

Tutorial Course DELIVERY Plan: NO Delivery Plan Exists
Tutorial Session wise Teaching – Learning Plan

No Session Plans Exists

Practical Course DELIVERY Plan:

Tutorial Session no	Topics	CO-Mapping
1	Write a Java program to demonstrate control statements and iterative statements.	CO5
2	Write a Java program that demonstrates the use of type conversion and casting.	CO5
3	Write a Java program that defines a class and the class methods and access variables through its objects.	CO5
4	Create a class Calculator with multiple overloaded methods named add. Implement polymorphism by providing different implementations of the add method that accept different numbers of parameters (e.g., two numbers, three numbers, or an array of numbers) and perform addition accordingly. Demonstrate polymorphism by creating instances of the Calculator class and calling different versions of the add method.	CO5
5	Write a Java program to illustrate the concept off multilevel inheritance and method overriding. Write a Java program using inheritance with the help of 'super' keyword.	CO5
6	Demonstrate polymorphism by creating instances of the Calculator class and calling different versions of the add method.	CO5
7	Create a base class Vehicle with properties like model and year. Make the Vehicle class final to prevent further inheritance. Then, attempt to create a subclass, Car, that tries to inherit from Vehicle. Observe and document the compiler error that occurs due to the final keyword.	CO5
8	a. Write a Java program that illustrates the multiple inheritance by using interfaces b. Write a Java program to illustrate the concept of abstract class.	CO5
9	Create a package named com.myapp.math with a class named Calculator that contains methods for basic mathematical operations (e.g., addition, subtraction). Import and use the Calculator class in a different package to perform mathematical calculations.	CO5
10	Define an interface Drawable with a draw method. Create a class Circle that implements the Drawable interface and provides an implementation of the draw method to draw a circle. Demonstrate how to implement and apply interfaces in Java by creating an instance of Circle and calling its draw method.	CO5

Tutorial Session no	Topics	CO-Mapping
11	Write a Java program that demonstrates the exception handling mechanism and nested try statements.	CO5
12	Write a Java program Creating a thread, Multithreading and illustrating inter thread communication.	CO5
13	Create a Java program that uses the List interface from the Java Collections Framework with generics. Implement a generic list to store various types of objects, and demonstrate how this approach ensures type safety.	CO5
14	Implement a Java program that uses a thread pool to manage and reuse a fixed number of threads for executing tasks concurrently.	CO5
15	Write a program that demonstrates the need for thread synchronization. Create multiple threads accessing a shared resource simultaneously without synchronization. Then, modify the program to use synchronization (e.g., synchronized keyword) and show how it resolves conflicts.	CO5
16	Create an ATM class to demonstrate encapsulation by making the account balance private and providing methods to access and modify it	CO5
17	Create a simple weather forecast program that provides weather conditions (e.g., sunny, rainy, cloudy) for a given location. Use control statements to simulate weather changes and provide forecasts for multiple days.	CO5
18	Write a Java program that interacts with a database using JDBC to perform the following operations: Create: Insert a new record into a database table. Prompt the user to enter data for the new record (e.g., name, age), and then insert it into the database . Read: Retrieve data from a specified database table based on user-defined criteria. Allow the user to specify a search criterion (e.g., name) and enter the corresponding value. Retrieve and display records from the database table that match the criteria. Delete: Delete a record from the database table. Prompt the user to specify the record to be deleted (e.g., by ID) and execute an SQL DELETE statement to remove it.	CO5

Practical Session wise Teaching – Learning Plan

SESSION NUMBER : 1

Session Outcome: 1 Program to demonstrate control statements and iterative statements.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
45	Write a Java program to demonstrate control statements and iterative statements.	4	PPT	--- NOT APPLICABLE ---
50	Write a Java program to demonstrate control statements and iterative statements.	4	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 2

Session Outcome: 1 Demonstrates the use of type conversion and casting in java.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods

5	Attendance	1	Talk	--- NOT APPLICABLE ---
45	Write a Java program that demonstrates the use of type conversion and casting.	4	PPT	--- NOT APPLICABLE ---
50	Write a Java program that demonstrates the use of type conversion and casting.	4	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 3

Session Outcome: 1 Java program that defines a class and the class methods and access variables through its objects.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
45	Write a Java program that defines a class and the class methods and access variables through its objects.	4	PPT	--- NOT APPLICABLE ---
50	Write a Java program that defines a class and the class methods and access variables through its objects.	4	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 4

Session Outcome: 1 Java program demonstrating method overloading

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
45	Write a Java program demonstrating method overloading.	4	PPT	--- NOT APPLICABLE ---
50	Write a Java program demonstrating method overloading.	4	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 5

Session Outcome: 1 Concept of inner classes.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
45	Write a Java program to illustrate the concept off multilevel inheritance and method overriding.	4	PPT	--- NOT APPLICABLE ---
50	Write a Java program using inheritance with the help of 'super' keyword.	4	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 6

Session Outcome: 1 Polymorphism

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---

45	Demonstrate polymorphism by creating instances of the Calculator class and calling different versions of the add method.	4	PPT	--- NOT APPLICABLE ---
50	Demonstrate polymorphism by creating instances of the Calculator class and calling different versions of the add method.	4	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 7

Session Outcome: 1 Demonstrate the use of Final Keyword

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
45	Create a base class Vehicle with properties like model and year. Make the Vehicle class final to prevent further inheritance. Then, attempt to create a subclass, Car, that tries to inherit from Vehicle. Observe and document the compiler error that occurs due to the final keyword.	4	PPT	--- NOT APPLICABLE ---
50	Create a base class Vehicle with properties like model and year. Make the Vehicle class final to prevent further inheritance. Then, attempt to create a subclass, Car, that tries to inherit from Vehicle. Observe and document the compiler error that occurs due to the final keyword.	4	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 8

Session Outcome: 1 Demonstrate the use of Interface and abstract class

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
45	a. Write a Java program that illustrates the multiple inheritance by using interfaces	4	PPT	--- NOT APPLICABLE ---
50	b. Write a Java program to illustrate the concept of abstract class.	4	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 9

Session Outcome: 1 Demonstrate the use of Package.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
45	Create a package named com.myapp.math with a class named Calculator that contains methods for basic mathematical operations (e.g., addition, subtraction). Import and use the Calculator class in a different package to perform mathematical calculations.	4	PPT	--- NOT APPLICABLE ---
50	Create a package named com.myapp.math with a class named Calculator that contains methods for basic mathematical operations (e.g., addition, subtraction). Import and use the Calculator class in a different package to perform mathematical calculations.	4	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 10

Session Outcome: 1 Define an interface Drawable with a draw method

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
45	Define an interface Drawable with a draw method. Create a class Circle that implements the Drawable interface and provides an implementation of the draw method to draw a circle. Demonstrate how to implement and apply interfaces in Java by creating an instance of Circle and calling its draw method.	4	PPT	--- NOT APPLICABLE ---
50	Define an interface Drawable with a draw method. Create a class Circle that implements the Drawable interface and provides an implementation of the draw method to draw a circle. Demonstrate how to implement and apply interfaces in Java by creating an instance of Circle and calling its draw method.	4	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 11

Session Outcome: 1 Exception Handling

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
45	Write a Java program that demonstrates the exception handling mechanism and nested try statements.	4	PPT	--- NOT APPLICABLE ---
50	Write a Java program that demonstrates the exception handling mechanism and nested try statements.	4	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 12

Session Outcome: 1 Multithreading

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
45	Write a Java program Creating a thread, Multithreading and illustrating inter thread communication.	4	PPT	--- NOT APPLICABLE ---
50	Write a Java program Creating a thread, Multithreading and illustrating inter thread communication.	4	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 13

Session Outcome: 1 List interface

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
45	Create a Java program that uses the List interface from the Java Collections Framework with generics. Implement a generic list to store various types of objects, and demonstrate how this approach ensures type safety.	4	PPT	--- NOT APPLICABLE ---

50	Create a Java program that uses the List interface from the Java Collections Framework with generics. Implement a generic list to store various types of objects, and demonstrate how this approach ensures type safety.	4	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 14

Session Outcome: 1 Thread Pool

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
45	Implement a Java program that uses a thread pool to manage and reuse a fixed number of threads for executing tasks concurrently.	4	PPT	--- NOT APPLICABLE ---
50	Implement a Java program that uses a thread pool to manage and reuse a fixed number of threads for executing tasks concurrently.	4	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 15

Session Outcome: 1 Thread Synchronization

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
45	Write a program that demonstrates the need for thread synchronization. Create multiple threads accessing a shared resource simultaneously without synchronization. Then, modify the program to use synchronization (e.g., synchronized keyword) and show how it resolves conflicts.	4	PPT	--- NOT APPLICABLE ---
50	Write a program that demonstrates the need for thread synchronization. Create multiple threads accessing a shared resource simultaneously without synchronization. Then, modify the program to use synchronization (e.g., synchronized keyword) and show how it resolves conflicts.	4	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 16

Session Outcome: 1 Encapsulation

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
45	Create an ATM class to demonstrate encapsulation by making the account balance private and providing methods to access and modify it	4	PPT	--- NOT APPLICABLE ---
50	Create an ATM class to demonstrate encapsulation by making the account balance private and providing methods to access and modify it	4	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 17

Session Outcome: 1 Control Statements

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods

5	Attendance	1	Talk	--- NOT APPLICABLE ---
45	Create a simple weather forecast program that provides weather conditions (e.g., sunny, rainy, cloudy) for a given location. Use control statements to simulate weather changes and provide forecasts for multiple days.	4	PPT	--- NOT APPLICABLE ---
50	Create a simple weather forecast program that provides weather conditions (e.g., sunny, rainy, cloudy) for a given location. Use control statements to simulate weather changes and provide forecasts for multiple days.	4	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 18

Session Outcome: 1 JDBC, Database connectivity

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
45	Write a Java program that interacts with a database using JDBC to perform the following operations: Create: Insert a new record into a database table. Prompt the user to enter data for the new record (e.g., name, age), and then insert it into the database . Read: Retrieve data from a specified database table based on user-defined criteria. Allow the user to specify a search criterion (e.g., name) and enter the corresponding value. Retrieve and display records from the database table that match the criteria. Delete: Delete a record from the database table. Prompt the user to specify the record to be deleted (e.g., by ID) and execute an SQL DELETE statement to remove it.	4	PPT	--- NOT APPLICABLE ---
50	Write a Java program that interacts with a database using JDBC to perform the following operations: Create: Insert a new record into a database table. Prompt the user to enter data for the new record (e.g., name, age), and then insert it into the database . Read: Retrieve data from a specified database table based on user-defined criteria. Allow the user to specify a search criterion (e.g., name) and enter the corresponding value. Retrieve and display records from the database table that match the criteria. Delete: Delete a record from the database table. Prompt the user to specify the record to be deleted (e.g., by ID) and execute an SQL DELETE statement to remove it.	4	PPT	--- NOT APPLICABLE ---

Skilling Course DELIVERY Plan:

Skilling session no	Topics/Experiments	CO-Mapping
1	Project	CO6

Skilling Session wise Teaching – Learning Plan

SESSION NUMBER : 1

Session Outcome: 1 The outcome of project encompasses software/system development, data analysis findings, and potential real-world impact.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---

45	Project Discussion and Evaluation	4	LTC	--- NOT APPLICABLE ---

WEEKLY HOMEWORK ASSIGNMENTS/ PROBLEM SETS/OPEN ENDEDED PROBLEM-SOLVING EXERCISES etc:

Week	Assignment Type	Assignment No	Topic	Details	co

COURSE TIME TABLE:

	Hour	1	2	3	4	5	6	7	8	9
Day	Component									
Mon	Theory	---	---	V-S2,V-S3	V-S2,V-S3	---	---	---	---	---
	Tutorial	---	---	--	--	---	---	---	---	---
	Lab	---	---	--	--	---	---	---	---	---
	Skilling	---	---	--	--	---	---	---	---	---
Tue	Theory	---	---	---	---	--	--	--	---	--
	Tutorial	---	---	---	---	--	--	--	---	--
	Lab	---	---	---	---	V-S2,V-S2,V-S3,V-S3	V-S2,V-S2,V-S3,V-S3	--	---	--
	Skilling	---	---	---	---	--	--	V-S1,V-S1	---	V-S1,V-S1
Wed	Theory	---	---	V-S1	V-S1	---	---	---	---	---
	Tutorial	---	---	--	--	---	---	---	---	---
	Lab	---	---	--	--	---	---	---	---	---
	Skilling	---	---	--	--	---	---	---	---	---
Thu	Theory	---	---	--	--	---	---	---	---	---
	Tutorial	---	---	--	--	---	---	---	---	---
	Lab	---	---	V-S1,V-S1	V-S1,V-S1	---	---	---	---	---
	Skilling	---	---	--	--	---	---	---	---	---

Fri	Theory	---	---	--	--	--	--	---	---	---
	Tutorial	---	---	--	--	--	--	---	---	---
	Lab	---	---	--	--	--	--	---	---	---
	Skilling	---	---	V-S2,V-S2,V-S3,V-S3	V-S2,V-S2,V-S3,V-S3	V-S1,V-S1,V-S2,V-S2,V-S3,V-S3	V-S1,V-S1,V-S2,V-S2,V-S3,V-S3	---	---	---
Sat	Theory	--	--	--	--	--	--	--	--	--
	Tutorial	--	--	--	--	--	--	--	--	--
	Lab	--	--	--	--	--	--	--	--	--
	Skilling	--	--	--	--	--	--	--	--	--
Sun	Theory	--	--	--	--	--	--	--	--	--
	Tutorial	--	--	--	--	--	--	--	--	--
	Lab	--	--	--	--	--	--	--	--	--
	Skilling	--	--	--	--	--	--	--	--	--

REMEDIAL CLASSES:

Supplement course handout, which may perhaps include special lectures and discussions that would be planned, and schedule notified according

SELF-LEARNING:

Assignments to promote self-learning, survey of contents from multiple sources.

S.no	Topics	CO	ALM	References/MOOCS

DELIVERY DETAILS OF CONTENT BEYOND SYLLABUS:

Content beyond syllabus covered (if any) should be delivered to all students that would be planned, and schedule notified accordingly.

S.no	Advanced Topics, Additional Reading, Research papers and any	CO	ALM	References/MOOCS

EVALUATION PLAN:

Evaluation Type	Evaluation Component	Weightage/Marks		Assessment Dates	Duration (Hours)	CO1	CO2	CO3	CO4	CO5	CO6
End Semester Summative Evaluation Total= 40 %	**Skill Sem-End Exam**	Weightage	8		120						8
		Max Marks	100								100
	End Semester Exam	Weightage	24		180	6	6	6	6		
		Max Marks	100			25	25	25	25		
	Lab End Semester Exam	Weightage	8		120					8	
		Max Marks	100							100	

In Semester Formative Evaluation Total= 24 %	**MOOCs Review**	Weightage	4		60	1	1	1	1		
		Max Marks	100			25	25	25	25		
	Skilling Continuous Evaluation	Weightage	5		60						5
		Max Marks	100								100
	ALM	Weightage	6		60	1.5	1.5	1.5	1.5		
		Max Marks	100			25	25	25	25		
	Home Assignment and Textbook	Weightage	4		60	1	1	1	1		
		Max Marks	40			10	10	10	10		
	Continuous Evaluation - Lab Exercise	Weightage	5		60					5	
		Max Marks	100							100	
In Semester Summative Evaluation Total= 36 %	**Semester in Exam-I**	Weightage	12		120	6	6				
		Max Marks	50			25	25				
	Semester in Exam-II	Weightage	12		120			6	6		
		Max Marks	50					25	25		
	Lab In Semester Exam	Weightage	6		120					6	
		Max Marks	100							100	
	Skill In-Sem Exam	Weightage	6		120						6
		Max Marks	100								100

ATTENDANCE POLICY:

Every student is expected to be responsible for regularity of his/her attendance in class rooms and laboratories, to appear in scheduled tests and examinations and fulfill all other tasks assigned to him/her in every course
In every course, student has to maintain a minimum of 85% attendance to be eligible for appearing in Semester end examination of the course, for cases of medical issues and other unavoidable circumstances the students will be condoned if their attendance is between 75% to 85% in every course, subjected to submission of medical certificates, medical case file and other needful documental proof to the concerned departments

DETENTION POLICY :

In any course, a student has to maintain a minimum of 85% attendance and In-Semester Examinations to be eligible for appearing to the Semester End Examination, failing to fulfill these conditions will deem such student to have been detained in that course.

PLAGIARISM POLICY :

Supplement course handout, which may perhaps include special lectures and discussions

COURSE TEAM MEMBERS, CHAMBER CONSULTATION HOURS AND CHAMBER VENUE DETAILS:

Supplement course handout, which may perhaps include special lectures and discussions

Name of Faculty	Delivery Component of Faculty	Sections of Faculty	Chamber Consultation Day (s)	Chamber Consultation Timings for each day	Chamber Consultation Room No:	Signature of Course faculty:
Dinesh G	P	2-B	-	-	-	-
Sekhar Babu	P	3-B	-	-	-	-
Kongara Ravindranath	L	2-MA	-	-	-	-
Kongara Ravindranath	P	2-A	-	-	-	-

Kongara Ravindranath	S	2-A	-	-	-	-
Chaitanya Krishna Bondalapu	S	1-B	-	-	-	-
Srinivas Malladi	L	3-MA	-	-	-	-
Srinivas Malladi	P	3-A	-	-	-	-
Srinivas Malladi	S	3-A	-	-	-	-
Bhagavan Konduri	P	1-B	-	-	-	-
Supriya Pacha	S	2-B	-	-	-	-
Faraz Hasan	S	1-B	-	-	-	-
M J D Ebinezer Markapurapu	S	3-B	-	-	-	-
Kapil Aggarwal	S	2-B	-	-	-	-
Chandolu Naga mani	S	3-B	-	-	-	-
Mohsin Khanday	L	1-MA	-	-	-	-
Mohsin Khanday	P	1-A	-	-	-	-
Mohsin Khanday	S	1-A	-	-	-	-
Selvamuthukumar T	S	3-A	-	-	-	-

GENERAL INSTRUCTIONS

Students should come prepared for classes and carry the text book(s) or material(s) as prescribed by the Course Faculty to the class.

NOTICES

Most of the notices are available on the LMS platform.

All notices will be communicated through the institution email.

All notices concerning the course will be displayed on the respective Notice Boards.

Signature of COURSE COORDINATOR
(Mohsin Fayaz Khanday)

Signature of Department Prof. Incharge Academics & Vetting Team Member
Department Of CSE-Honors

HEAD OF DEPARTMENT:

Approval from: DEAN-ACADEMICS
(Sign with Office Seal)