SARDAR VALLABHBHAI PATEL EDUCATION SOCIETY'S
R. N. G. PATEL INSTITUTE OF TECHNOLOGY - RNGPIT
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Program Name: Integrated M.Sc. (IT)
Level: Post Graduate
Branch: Information Technology
Subject Code : 1BS305
Subject Name :Java Programming

w. e. f. Academic Year:	2025
Semester:	3
Category of the Course:	Major Course

Prerequisite:	C++ Programming
Rationale:	With its "write once, run anywhere" capability enabled by the Java Virtual Machine (JVM), Java introduces students to cross-platform software development and runtime environments.

Course Outcome:
After Completion of the Course, Student will be able to:

No	Course Outcomes
01	Demonstrate Java programming knowledge, including its history, features, and programs.
02	Construct programs using object-oriented principles in Java.
03	Describe multithreading in Java and organize code using packages.
04	Manipulate data structures in Java using Collections, Iterators, and comparison interfaces.

05	Develop interactive GUIs using JavaFX.
06	Utilize JDBC to connect to databases and execute SQL.

Teaching and Examination Scheme:

Teaching Scheme (in Hours per week)			Total Credits	Assessment Pattern and Marks				Total Marks
				Theory		Tutorial / Practical		
L	T	PR	C	SEE (TH)	IAT	CCE	SEE (P)	
2	0	4	4	70	30	20	30	150

Where SEE: Semester End Examination, IAT: Internal Assessment Test, CCE: Continuous and Comprehensive Evaluation

Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1.	**UNIT 1: Introduction to Java** 1.1 History and Features of Java 1.2 Comparison of java with C++ 1.3 Java Compiler, Java Interpreter 1.4 Identifier, Literals, Operators, Variables, Keywords, Data Types 1.5 Branching: If – Else, Switch..Case 1.6 Looping: While, Do-while, For 1.7 Type Casting	**4**	**15**
2.	**UNIT 2: Class and Object** 2.1 Java classes and objects 2.2 Constructors and methods 2.3 Inheritance and polymorphism 2.4 Interfaces and abstract classes 2.5 String, StringBuffer and StringBuilder Classes 2.6 String Operations	**7**	**20**

	2.7 Exception Handling		
3.	**UNIT 3: Threads and Packages:** 3.1 Thread 3.1.1 Introduction to Threads, Thread Model 3.1.2 Priority of Threads 3.2 Package Naming, Type Imports 3.2.1 Package Access, Package Contents 3.2.2 Package Object and Specification	**4**	**15**
4.	**UNIT 4: Java Collections Framework** 4.1 Collection interfaces: List, Set, Map 4.2 Implementations: ArrayList, LinkedList, HashSet, HashMap 4.3 Iterators and enhanced for-loop 4.4 Comparator and Comparable interfaces	**4**	**15**
5.	**UNIT 5: Introduction to JavaFX** 5.1 Introduction 5.2 Installation 5.3 Architecture 5.4 UI Elements 5.5 Applications 5.6 2D shapes	**7**	**20**
6.	**Unit 6 : Database Connectivity (JDBC)** 6.1 JDBC architecture and drivers 6.2 Establishing database connections 6.3 Executing SQL queries and updates 6.4 PreparedStatement and ResultSet handling	**4**	**15**
	Total	**30**	**100**

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
20	**40**	**40**	**-**	**-**	**-**

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

References/Suggested Learning Resources:

(a) Books:

1. Java Programming Black Book Dreamtech Press

2. Programming with JAVA, E Balagurusamy,McGrawHill
3. Core JAVA volume -I Cay Horstmann,Pearson
4. Java: The Complete Reference (12th Edition) – *by Herbert Schildt, McGraw Hill*
5. JDBC Pocket Reference: A Quick Guide for Programmers
by Donald Bales,O'RELLY
6. JavaFX Simplified : A Beginner's Guide to Creating User Interfaces by Prof. Parth Sharma & Prof. Mansi Vegad, Notion Press Media Pvt Ltd

(b) Open source software and website:

1. **Java Tutorial**
2. **https://www.tpointtech.com/java-tutorial**
3. **https://docs.oracle.com/javase/tutorial/**
4. **https://www.tutorialspoint.com/javafx/index.htm**

Suggested Course Practical List:

Sr. No.	Name of Practical
1	Write a program that prints the multiplication table for a given number (e.g., 5) using a for loop.
2	Create a superclass Shape with a method area() that returns a generic area. Create two subclasses Circle and Rectangle that override the area() method to calculate the area of the respective shapes. Instantiate both subclasses and display their areas.
3	Create a simple Java program that demonstrates the creation of a thread using the Thread class. Implement run() method and display a message when the thread starts.
4	Implement a program that demonstrates the basic thread lifecycle (new, runnable, blocked, terminated) using the Thread class methods (start(), sleep(), join(), etc.).
5	Write a Java program that creates a HashMap to store student names as keys and their grades as values. Display all entries in the map.
6	Implement a custom Comparator to sort a list of integers in descending order. Use it with Collections.sort() to reorder the list.
7	Create a simple JavaFX application. The button should change the text of the text field when clicked.
8	Apply design principles to a simple login form, ensuring proper alignment, spacing, and visual clarity using appropriate layout managers and components.
9	Write a Java program that establishes a connection to a MySQLdatabase using *DriverManager* and Connection objects.
10	Implement a Java program to perform INSERT, UPDATE, and DELETE operations on a database using

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