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	7	20

	2.5 String, StringBuffer and StringBuilder Classes 2.6 String Operations 2.7 Exception Handling		3
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	7	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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