

SES's L.S. RAHEJA COLLEGE OF ARTS AND COMMERCE(AUTONOMOUS)



BOARD OF STUDIES: Information Technology and Data Science

PROGRAMME: Bachelor of Science (Information Technology)

SEMESTER: IV

NOMENCLATURE OF THE COURSE: CORE JAVA

NEP Vertical: MAJOR

Credit: 04

(As Per Choice Based Credit System (under NEP 2020) with effect from the academic year 2025-26)



Programme:	Bachelor of Science (Information Technology)
Nomenclature of the Course	Core Java
Total Marks	100
Semester:	IV
Academic year	2025-26

LEARNING OBJECTIVES:

- Introduce Java fundamentals, architecture, components, and environment setup.
- Explain Java programming constructs, including operators, control flow, loops, and OOP concepts.
- Explore advanced Java features like multithreading, exception handling, I/O streams, event handling, and GUI development.

COURSE OUTCOMES:

- Understand Java architecture, JVM, JDK, and develop basic Java applications.
- Implement object-oriented programming concepts, inheritance, interfaces, and collections.
- Develop multithreaded applications, handle exceptions, perform file operations, and design GUI-based applications.

Unit	Course Content	Andragogy	No of Lectures
I	<p>Introduction: History, architecture and its components, Java Class File, Java Runtime Environment, The Java Virtual Machine, JVM Components, The Java API, java platform, java development kit, Lambda Expressions, Methods References, Type Annotations, Method Parameter Reflection, setting the path environment variable, Java Compiler And Interpreter, java programs, java applications, main(), public, static, void, string[] args, statements, white space, case sensitivity, identifiers, keywords, comments, braces and code blocks, variables, variable name</p> <p>Operators and properties of operators: Arithmetic operators, assignment operators, increment and decrement operator, relational operator, logical operator, bitwise operator, conditional operator.</p> <p>Control Flow Statements: The If...Else If...Else Statement, The Switch...Case Statement</p> <p>Iterations: The While Loop, The Do ... While Loop, The For Loop, The Foreach Loop, Labeled Statements, The Break And Continue Statements, The Return Statement</p>	<ul style="list-style-type: none"> • Give students problems: Provide problems for students to solve independently or in groups. • Focus on practical applications: Present knowledge and abilities in terms of their practical uses. • Use real-life examples: Incorporate real life examples into lessons. 	15

<p>II</p>	<p>Classes: Types of Classes, Scope Rules, Access Modifier, Instantiating Objects From A Class, Initializing The Class Object And Its Attributes, Class Methods, Accessing A Method, Method Returning A Value, Method's Arguments, Method Overloading, Wrapper classes Variable Arguments [Varargs], Constructors, this Instance, super Instance, Characteristics Of Members Of A Class, constants, this instance, static fields of a class, static methods of a class, garbage collection.</p> <p>Inheritance: Derived Class Objects, Inheritance and Access Control, Default Base Class Constructors, this and super keywords. Abstract Classes And Interfaces, Abstract Classes, Abstract Methods, Interfaces, What Is An Interface? How Is An Interface Different From An Abstract Class?, Multiple Inheritance, Default Implementation, Adding New Functionality, Method Implementation, Classes V/s Interfaces, Defining An Interface, Implementing Interfaces. Packages: Creating Packages, Default Package, Importing Packages, Using A Package</p>	<ul style="list-style-type: none"> • Focus on practical applications: Present knowledge & abilities in terms of their practical uses. • Consider self-concept: Give adults autonomy over their learning so they can thrive on self-direction 	<p>15</p>
<p>III</p>	<p>Enumerations, Arrays: Two Dimensional Arrays, Multi-Dimensional Arrays, Vectors, Adding Elements To A Vector, Accessing Vector Elements, Searching For Elements In A Vector, Working With The Size of The Vector. Java strings</p> <p>Multithreading: the thread control methods, thread life cycle, the main thread, creating a thread, extending the thread class.</p> <p>Exceptions: Catching Java Exceptions, Catching Run-Time Exceptions, Handling Multiple Exceptions, The finally Clause, The throws Clause</p> <p>Byte streams: reading console input, writing console output, reading file, writing file, writing binary data, reading binary data, getting started with character streams, writing file, reading file</p>	<ul style="list-style-type: none"> • Give students problems: Provide problems for students to solve independently or in groups. • Focus on practical applications: Present knowledge and abilities in terms of their practical uses. • Use real-life examples: Incorporate real life examples into lessons. 	<p>15</p>

IV	<p>Event Handling: Delegation Event Model, Events, Event classes, Event listener interfaces, Using delegation event model, adapter classes and inner classes.</p> <p>Abstract Window Toolkit: Window Fundamentals, Component, Container, Panel, Window, Frame, Canvas.Components –</p> <p>Labels, Buttons, Check Boxes, Radio Buttons, Choice Menus, Text Fields, Text, Scrolling List, Scrollbars, Panels, Frames</p> <p>Layouts: Flow Layout, Grid Layout, Border Layout, Card Layout.</p>	<ul style="list-style-type: none"> • Focus on practical applications: Present knowledge and abilities in terms of their practical uses. • Consider self-concept: Give adults autonomy • over their learning so they can thrive on self-direction 	15
-----------	---	---	-----------

SUGGESTED READINGS:

1. Shah, V., & Shah, S. (2015). *Core Java 8 for beginners* (1st ed.). SPD.
2. Schildt, H. (2014). *Java: The complete reference* (9th ed.). McGraw Hill.
3. Murach, J., & Urban, M. (2016). *Murach's beginning Java with NetBeans* (1st ed.). SPD.
4. Horstmann, C. S. (2013). *Core Java, Volume I: Fundamentals* (9th ed.). Pearson.

QUESTION PAPER PATTERN

(A) FOR CONTINUOUS EVALUATION

Particulars	Marks
Class Test	20
Presentation/Viva Voce/Quiz	10
Assignment/Project	10
Total	40

(B) FOR SEMESTER END EXAMINATION

Maximum Marks: 60

Duration: 2 Hours

Question No.	Description	Total Marks	
Q. 1	Attempt the following Unit I	15	
A	Remembering		
B	Analysing		
C	Applying		
	OR		
P	Remembering		
Q	Analysing		
R	Applying		
Q. 2	Attempt the following Unit II		15
A	Understand		
B	Analysing		
C	Evaluating		
	OR		
P	Understand		
Q	Analysing		
R	Evaluating		
Q. 3	Attempt the following Unit III	15	
A	Understand		
B	Apply		
C	Evaluating		
	OR		
P	Understand		
Q	Apply		
R	Evaluating		
Q. 4	Attempt the following Unit IV		15
A	Understand		
B	Evaluating		
C	Creating		
	OR		
P	Understand		
Q	Evaluating		
R	Creating		