

**DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE**

**Syllabus**

Course Code	Course Name	L	T	P	C
Value Added Course	Core Java Essentials	15	0	30	2

**Course Objectives**

- To understand the fundamentals of Java programming, syntax, and execution environment.
- To learn core Object-Oriented Programming (OOPS) concepts for building structured and reusable code.
- To apply loops, conditional statements, and functions to solve computational problems.
- To enhance the skills of students in terms of decoding the programming logic and program on their own.
- To make them well equipped to face the technical interview.

**UNIT 1: INTRODUCTION TO JAVA PROGRAMMING BASICS (9)**

Introduction to Java C JVM-Features of Java-JDK, JRE, JVM-Installing Java C IDE (Eclipse / IntelliJ / VS Code)-Structure of a Java program-main() method-Variables and Data Types-Input/Output (Scanner, System.out)

**UNIT 2: CONTROL STATEMENTS S ARRAYS (9)**

Operators (Arithmetic, Relational, Logical)-Conditional Statements (if, if-else, switch)-Looping Statements (for, while, do-while)-Introduction to Arrays (1D C 2D)-Enhanced for loop

**UNIT 3: OBJECT-ORIENTED PROGRAMMING (OOPS) CONCEPTS (9)**

Classes and Objects-Constructors-this keyword -Encapsulatio-Inheritance-Method Overloading -static keyword.

#### **UNIT 4: ADVANCED OOP S EXCEPTION HANDLING (9)**

Polymorphism-Method Overriding-final keyword-Abstract classes-Interfaces-Packages-Exception Handling(try, catch, finally, throw, throws)-Common built-in exception

#### **UNIT 5: COLLECTIONS, FILE HANDLING S MINI PROJECT (9)**

Java Collections Framework-ArrayList, LinkedList, HashMap-Introduction to File Handling-Reading/Writing files- Overview of Java applications in industry-Coding best practices

#### **Course Outcomes**

At the end of the course, students will be able to:

CO1: Write structured Java programs

CO2: Apply OOP concepts effectively

CO3: Solve engineering-oriented problems using Java

CO4: Build small real-world Java applications

CO5: Demonstrate strong problem-solving skills by designing efficient Java programs for real world.

## CO-PO Mapping and SDG Mapping

### CO - PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	H	M	-	-	M	-	-	-	-	-	-	M	M
CO2	H	M	M	-	M	-	-	-	-	-	-	H	M
CO3	H	M	M	L	H	-	-	-	-	-	-	M	M
CO4	H	H	H	M	H	L	-	-	L	L	-	H	M
CO5	H	H	H	M	H	L	L	-	L	-	L	H	H

### SDG Mapping

CO's	SDG mapping with CO's	
CO1	SDG 04 - Quality Education	-
CO2	SDG 04 - Quality Education	SDG 8 – Decent Work and Economic Growth
CO3	SDG 04 - Quality Education	SDG 09 - Industry, Innovation, and Infrastructure SDG 8 – Decent Work and Economic Growth
CO4	SDG 04 - Quality Education	SDG 09 - Industry, Innovation, and Infrastructure SDG 8 – Decent Work and Economic Growth SDG 11 – Sustainable Cities and Communities
CO5	SDG 04 - Quality Education	SDG 09 - Industry, Innovation, and Infrastructure SDG 8 – Decent Work and Economic Growth SDG 11 – Sustainable Cities and Communities