



(An Autonomous Institution - AFFILIATED TO ANNA UNIVERSITY, CHENNAI)
S.P.G.Chidambara Nadar - C Nagammal Campus
S.P.G.C. Nagar, K.Vellakulam – 625 701 (Near VIRUDHUNAGAR).

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Industry Certified Value Added Course on

“Data Structures Using Java”

05-01-2026 to 10-01-2026 (2025 – 2026 EVEN)

COURSE OBJECTIVES

- Understand the fundamentals of OOP, including classes, objects, methods, and constructors.
- Apply core OOP principles such as encapsulation, inheritance, polymorphism, and abstraction.
- Apply exception handling and file handling in object-oriented programs.
- Understand interfaces and abstract classes and their practical usage.
- Use Java Collections Framework effectively and compare it with custom implementations.
- Implement data structures using Java, applying object-oriented programming concepts.

UNIT 1: INTRODUCTION TO OOPS AND JAVA FUNDAMENTALS

(10 hours)

Object Oriented Programming Concepts – Fundamental Programming Structures in Java – Data Types – Variables and Constants – Operators – Control Flow Statements. Arrays – Strings – Defining Classes and Objects – Methods – Constructors.

UNIT 2: INHERITANCE AND INTERFACES

(10 hours)

Inheritance – Super classes & Sub classes – Types of Inheritance – Abstract classes and methods – Final classes and methods – Interfaces.

UNIT 3: EXCEPTION AND FILE HANDLING

(10 hours)

Exceptions – Built-in Exceptions – Creating own exceptions – Input / Output Streams Basics – Byte streams and Character streams.

UNIT 4: MULTITHREADING AND GENERIC PROGRAMMING

(10 hours)

Thread life cycle – Creating threads – Thread Synchronization – Generic classes – Generic methods - JDBC.

UNIT 5: LINEAR AND NON-LINEAR DATA STRUCTURE IN JAVA

(10 hours)

Overview of Data Structures-Classification of Data Structures-Linear vs Non-Linear Data Structures-One-Dimensional and Multi-Dimensional Arrays- Linked list, operations- Stack, Operations Strings and String Operations in Java.

Total: 50Hours

COURSE OUTCOMES

After successful completion of the course, the students will be able to

CO. No.	Course Outcome	Knowledge Level
CO1	Explain the Java language basic constructs	K2 - Apply
CO2	Demonstrate inheritance and interfaces exception handling	K3 - Apply
CO3	Demonstrate exception handling and file handling	K3 - Apply
CO4	Build simple Java applications using threads and generic class	K3 - Apply
CO5	Develop Data Structures using Java	K3 - Apply

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO1:

Professional Skills: The ability to understand, analyze and develop computer programs in the areas related to algorithms, system software, multimedia, web design, big data analytics, and networking for efficient design of computer-based systems of varying complexity.

PSO2:

Problem - Solving Skills: The ability to apply standard practices and strategies in software project development using open-ended programming environments to deliver a quality product for business success.

CO - PO MAPPING

Course Name	CO. No.	POs											PSOs	
		1	2	3	4	5	6	7	8	9	10	11	1	2
Data Structures using Java	CO1	3	2	-	-	2	-	-	-	-	-	2	2	1
	CO2	3	2	2	-	2	-	-	-	-	2	3	2	
	CO3	3	3	2	-	2	-	-	-	-	2	3	3	
	CO4	3	3	3	-	2	-	-	-	-	2	2	3	
	CO5	3	3	3	2	2	-	-			3	2	3	

H - High, M - Moderate, L - Low
SDG MAPPING

Data Structures using Java	SDGs																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
				✓					✓								

A. N. Jany
Trainer

VAC Course Incharges

Archana Devi
VAC Coordinators

Mehal
HOD - CSE