

**OBJECT ORIENTED PROGRAMMING THROUGH JAVA**

<b>Course Code</b>	23CS3302	<b>Year</b>	II	<b>Semester</b>	I
<b>Course Category</b>	PC	<b>Branch</b>	CSE	<b>Course Type</b>	THEORY
<b>Credits</b>	3	<b>L – T – P</b>	3-0-0	<b>Prerequisites</b>	C Programming language
<b>Continuous Evaluation:</b>	30	<b>Semester End Evaluation:</b>	70	<b>Total Marks:</b>	100

<b>Course Outcomes</b>		
Upon successful completion of the course, the student will be able to:		
<b>CO1</b>	Understand the syntax and semantics of JAVA programming language to solve a given problem.	L3
<b>CO2</b>	Apply the knowledge of Object Oriented Programming principles to develop applications by analyzing the given problem.	L4
<b>CO3</b>	Apply the concepts of packages, I/O and Exception handling mechanisms to develop efficient programming.	L4
<b>CO4</b>	Analyze the concepts of Multithreading and Collection Framework to develop applications which mimic the real-world scenarios.	L5

<b>Syllabus</b>		
<b>Unit No.</b>	<b>CONTENTS</b>	<b>Mapped CO</b>
<b>I</b>	<p><b>Object Oriented Programming:</b> Basic concepts, Principles, Program Structure in JAVA: Introduction, Writing Simple JAVA Programs, Elements or Tokens in JAVA Programs, JAVA Statements, Command Line Arguments, User Input to Programs, Escape Sequences Comments, Programming Style.</p> <p><b>Data Types, Variables, and Operators :</b>Introduction, Data Types in JAVA, Declaration of Variables, Data Types, Type Casting, Scope of Variable Identifier, Literal Constants, Symbolic Constants, Formatted Output with printf() Method, Static Variables and Methods, Attribute Final, <b>Introduction to Operators</b>, Precedence and Associativity of Operators, Assignment Operator ( = ), Basic Arithmetic Operators, Increment (++) and Decrement (- -) Operators, Ternary Operator, Relational Operators, Boolean Logical Operators, Bitwise Logical Operators.</p> <p><b>Control Statements :</b>Introduction, if Expression, Nested if Expressions,</p>	<b>CO1</b>

	if-else Expressions, Ternary Operator?:, Switch Statement, Iteration Statements, while Expression, do-while Loop, for Loop, Nested for Loop, For-Each for Loop, Break Statement, Continue Statement.	
II	<p><b>Classes and Objects:</b> Introduction, Class Declaration and Modifiers, Class Members, Declaration of Class Objects, Assigning One Object to Another.</p> <p><b>Constructor and Methods:</b> Introduction, Defining Methods, Overloaded Methods, Constructors, Overloaded Constructor Methods, Class Objects as Parameters in Methods, Access Control, Accessing Private Members of Class, Recursive Methods, final method, Passing Arguments by Value and by Reference, Keyword this, final and static, Nested classes.</p> <p><b>String Handling in JAVA:</b> Introduction, Interface Char Sequence, Class String, Methods for Extracting Characters from Strings, Comparison, Modifying, Searching; Class String Buffer.</p>	CO1,CO2
III	<p><b>Arrays:</b> Introduction, Declaration and Initialization of Arrays, Storage of Array in Computer Memory, Accessing Elements of Arrays, Operations on Array Elements, Assigning Array to Another Array, Dynamic Change of Array Size, Sorting of Arrays, Search for Values in Arrays, Class Arrays, Two-dimensional Arrays, Arrays of Varying Lengths, Three-dimensional Arrays, Arrays as Vectors.</p> <p><b>Inheritance:</b> Introduction, Process of Inheritance, Types of Inheritances, Universal Super Class-Object Class, Inhibiting Inheritance of Class Using Final, Access Control and Inheritance, Multilevel Inheritance, Application of Keyword Super, Constructor Method and Inheritance, Method Overriding, Dynamic Method Dispatch, Abstract Classes.</p> <p><b>Interfaces:</b> Introduction, Declaration of Interface, Implementation of Interface, Multiple Interfaces, Nested Interfaces, Inheritance of Interfaces, Default Methods in Interfaces, Static Methods in Interface.</p>	CO1,CO2
IV	<p><b>Packages and JAVA Library:</b> Introduction, Defining Package, Importing Packages and Classes into Programs, Path and Class Path, Access Control, Packages in JAVA SE, java.lang Package and its Classes, Class Object, class Math, Wrapper Classes, Auto-boxing and Auto-unboxing.</p> <p><b>Exception Handling:</b> Introduction, Hierarchy of Standard Exception Classes, Keywords throws and throw, try, catch, and finally Blocks, Multiple Catch Clauses, Class Throwable, Unchecked Exceptions, Checked Exceptions, custom exceptions.</p> <p><b>Java I/O and File:</b> Java I/O API, standard I/O streams, types, Byte streams, Character streams, Scanner class, Files in Java: File, FileInputStream and FileOutputStream Classes(Text Book 2)</p>	CO1,CO3
V	<p><b>Multithreaded Programming:</b> Introduction, Need for Multiple Threads Multithreaded Programming for Multi-core Processor, Thread Class, Main Thread-Creation of New Threads, Thread States, Thread Priority</p> <p><b>Collections Framework:</b> Introduction, Purpose of Collection Framework Application of Collection Framework, Hierarchy of collection Interfaces / classes, Methods defined in Collection Interface, Interface Iterator,</p>	CO1,CO4

	Collection classes/Interfaces –List, Queue, Set, ArrayList class, HashSet, PriorityQueue.	
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### Learning Resources

#### Text Books

- 1) JAVA one step ahead, Anitha Seth, B.L.Juneja, Oxford.
- 2) Joy with JAVA, Fundamentals of Object Oriented Programming, DebasisSamanta, Monalisa Sarma, Cambridge, 2023.

#### Reference Books

- 1) The complete Reference Java, 11<sup>th</sup>edition, Herbert Schildt, TMH
- 2) Introduction to Java programming, 7<sup>th</sup> Edition, Y Daniel Liang, Pearson

#### E-Resources & other digital material

- 1) <https://nptel.ac.in/courses/106/105/106105191/>
- 2) [https://infyspringboard.onwingspan.com/web/en/app/toc/lex\\_auth\\_012880464547618816347\\_shared/overview](https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_012880464547618816347_shared/overview)