NIRMA UNIVERSITY

Institute:	Institute of Technology
Name of Programme:	BTech All (Other than CSE)
Course Code:	4CS508IE25
Course Title:	Object Oriented Programming
Course Type:	Interdisciplinary Minor-Elective
Year of Introduction:	2025-26

L	T	Practical Component				C
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Course Learning Outcomes (CLO)

At the end of this course, the students will be able to –

1. explain procedural and object-oriented paradigms and principles (BL2)
2. relate the concepts of object-oriented design with principles of object-oriented programming (BL2)
3. apply exception handling, input-output operations, and multi-threading concepts for application development (BL3)
4. develop programs using object-oriented concepts. (BL6)

Unit	Contents	Teaching Hours (Total 45)
Unit-I	**Introduction:** A Review of programming paradigms, Introduction to Object Oriented Programming and principles, Comparison of Object-Oriented approach with other programming approaches, Bytecode, JVM and JDK, Introduction to classes and methods	08
Unit-II	**Data Types, Variables, and Operators in Java**: Arrays: single and multi-dimensional arrays, alternative array declaration statements, Control Statements, and loops	06
Unit-III	**Classes and Methods**: Class fundamentals, objects, assigning object reference variables, methods in class, constructors, this keyword, garbage collection, finalize () method, overloading methods, argument passing, access control, static, final, nested and inner classes, command line arguments, variable-length arguments, String Handling in Java, Inheritance: Basics, member access, multilevel hierarchy, constructor call sequence, method overriding, dynamic method dispatch, abstract classes	11
Unit-IV	**Packages and Interfaces**: Defining a package, finding packages and CLASSPATH, access protection, importing packages, interfaces, variables in interfaces, extending interfaces, an instance of operator	06
Unit-V	**Exception Handling**: fundamental, exception types, uncaught exceptions, try, catch, throw, throws, finally, multiple catch clauses, nested try statements, built-in exceptions, custom exceptions (creating your own exception subclasses).	07
Unit -VI	**Multithreaded Programming:** Java thread model, thread priorities, synchronization, messaging, Thread class, Runnable interfaces, creating a thread(s), Thread class methods, Synchronization, Inter thread Communication, volatile operators.	07

Self-Study:
The self-study contents will be declared at the commencement of the semester. Around 10% of the questions will be asked from self-study contents

Suggested Readings/ References:

1. Herbert Schildt, Java – The Complete Reference, Tata McGraw Hill
2. Balagurusamy, Programming with Java – A primer, Tata McGraw Hill
3. David Flanagan, Student Workbook Java in a Nutshell O'Reilly
4. Cay S. Horstmann Core Java (TM), Volume I—Fundamentals Prentice Hall
5. Frederick A. Hosch Jaime Nino, Introduction to Programming and Object-Oriented Design Using Java, Wiley

Suggested List of Experiments:

Sr. No.	Title	Hours
1	To implement programs related to preliminaries and basic Java Programming	02
2	To implement programs related to operators and their applications	04
3	To implement programs related to operators and the use of arrays	04
4	To implement programs related to class and objects	02
5	To implement programs related to string handling	04
6	To implement programs related to inheritance	04
7	To implement programs related to the abstract class	02
8	Implement programs related to packages and interfaces and their utilization in the program.	04
9	To implement programs related to exception handling	02
10	To implement programs related to the multithreading concept	02