Name of the Program:	BTECH CSE-AIML	Semester: 4	Level: UG
Course Name:	Java Programming	Course Code/ Course Type	UBTML210/PCC
Course Pattern:	2025	Version	1.0

Teaching Scheme					Assessment Scheme		
Theory	Practical	Tutorial	Total Credits	Hours	CIA (Continuous Internal Assessment)	ESA (End Semester Assessment)	Practical/ Oral
3	-	-	3	3	40	60	-

Pre-Requisite:

1. Basic knowledge of Programming in C and C++

Course Objectives (CO):	**The objective of Java Programming are:** 1. To learn the fundamentals of the Java programming language 2. To learn object-oriented principles like abstraction, encapsulation, inheritance, and polymorphism and apply them in solving problems using java 3. To apply the concepts of exception handling, multithreading and collection classes using java 4. To develop software applications using JDBC connectivity. 5. To design the Graphical User Interface using applets and swing controls.
Course Learning Outcomes (CLO):	**Students would be able to:** 1. To grasp the fundamentals programming concepts of Java programming language 2. To apply object-oriented principles like abstraction, encapsulation, inheritance, polymorphism in solving problems using java 3. To perform exception handling, multithreading code using java 4. To develop software applications using JDBC connectivity 5. To design the Graphical User Interface using event handling

Course Contents/Syllabus:

Descriptors/Topics	CLO	Hours
UNIT I		
Introduction to Java Programming Java Programming- History of Java, comments, Java Buzz words, Data types, Variables, Constants, Scope and Lifetime of variables, Operators, Type conversion and casting, Enumerated types, Control flow- block scope, conditional statements, loops, break and continue statements, arrays, simple java standalone programs, class, object, and its methods constructors, methods, static fields and methods, access control, this reference, overloading constructors, recursion, exploring string class, garbage collection.	CLO 1	9
UNIT II		
Inheritance: Inheritance – Inheritance types, super keyword, preventing inheritance: final classes and methods. Polymorphism – method overloading and method overriding, abstract classes and methods. Interfaces- Interfaces Vs Abstract classes, defining an interface, implement interfaces, accessing implementations through interface references, extending interface, inner class. Packages- Defining, creating and accessing a package, importing packages.	CLO 2	9

UNIT III		
Exception Handling and Multithreading: Exception handling-Benefits of exception handling, the classification of exceptions - exception hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally, creating own exception subclasses. Multithreading – Differences between multiple processes and multiple threads, thread life cycle, creating threads, interrupting threads, thread priorities, synchronizing threads, inter-thread communication, producer consumer problem	**CLO 3**	**9**
UNIT IV		
Database Management Collection Framework in Java – Introduction to java collections, Overview of java collection framework, commonly used collection classes- Array List, Vector, Hash table, Stack, Lambda Expressions. Files- Streams- Byte streams, Character streams, Text input/output, Binary input/output, File management using File class. Connecting to Database – JDBC Type 1 to 4 drivers, connecting to a database, querying a database and processing the results, updating data with JDBC, Data Access Object (DAO).	**CLO 4**	**9**
UNIT V		
Event Handling: GUI Programming with Swing - The AWT class hierarchy, Introduction to Swing, Swing Vs AWT, Hierarchy for Swing components, Overview of some Swing components – Jbutton, JLabel, JTextField, JTextArea, simple Swing applications, Layout management – Layout manager types – border, grid and flow Event Handling- Events, Event sources, Event classes, Event	**CLO 5**	**9**
Total Hours		**45**

Learning Resources:

Text Books:

1. "Java Fundamentals a Comprehensive Introduction" HerbertSchildt and DaleSkrien,TMH
2. "Head First Java: Your Brain on Java - A Learner's Guide", 1st Edition, by Bert Bates, Kathy Sierra

Reference Books:

1. "Java: the complete reference" by Herbert Schildt and DaleSkrien, TMH
2. "Java For Dummies (For Dummies" (Computer/Tech)) 8th Edition by Barry Burd

Online Resources/E-learning Resources:

1. https://onlinecourses.nptel.ac.in/noc20-cs58/preview Programming in Java by Prof. Debasis Samanta
2. https://onlinecourses.nptel.ac.in/noc2