COURSE TITLE	**SOFTWARE DEVELOPMENT USING JAVA**
COURSE CODE	**05CA0304**
COURSE CREDITS	**4**

Objective:

1 Identify and describe the fundamentals of programming such as variables, conditionals, loops, and methods
2 Explain the core concepts of object-oriented programming in Java, including class creation, method invocation, and the use of standard class libraries
3 Apply object-oriented principles to design and implement basic Java programs

Course Outcomes: After completion of this course, student will be able to:

1 Explain the core concepts of Object-Oriented Programming (OOP) such as inheritance, polymorphism, encapsulation, and abstraction
2 Apply the principles of Advanced Java programming to develop dynamic and robust applications
3 Apply the principles of Advanced Java programming to develop dynamic and robust applications
4 Implement database connectivity using Java Database Connectivity (JDBC) to perform CRUD operations

Pre-requisite of course:NA

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
3	0	2	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	**Java Introduction** Why Java , Paradigms , Diff B/W Java & Other (C,C++) , Java History, Java Features, Java programming format , Java Statements , Java Data Types, Introduction of OOPS , Object , Constructors , This Key Word, Inheritance , Super Key Word , Polymorphism (Over Loading & Over Riding) , Abstraction , Interface , Encapsulation, Introduction to all predefined packages , User Defined Packages , Access Specifiers	10
2	**Advanced Core Java** What is Array , Single Dimensional Array ,Multi-Dimensional Array , Sorting of Arrays, String ,String Buffer, Introduction of Exception Handling , Pre-Defined Exceptions , Try-Catch-Finally , Throws, throw , User Defined Exception examples	10

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Contents : Unit	Topics	Contact Hours
3	**AWT** Components, Event-Delegation-Model, Listeners, Layouts , Individual Components Label, Button, Check Box, Radio Button, Choice, List, Menu, Text Field, Text Area, Event handling using interfaces. Examples of event handling on Button, Checkbox, Radio button, Choices, List, Menu	15
4	**Database Connection & Result set** JDBC Architecture, Types of Drivers, type-1, Type-2, type-3, Type-4, Statement, Result Set, Read Only Result Set, Updatable Result Set	10
Total Hours		**45**

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	**Unit 1** Write a Java program to demonstrate basic syntax, including variables, data types, and statements, Implement constructors and the this keyword in a class, Create a Java program to demonstrate inheritance and the super keyword, Implement method overloading and method overriding in Java, Develop a program using user-defined packages and different access specifiers	15
2	**Unit 2** Create a Java program to demonstrate single-dimensional and multi-dimensional arrays with sorting, Implement String and StringBuffer to perform string manipulations, Write a Java program to handle exceptions using try-catch-finally and throws/throw, Develop a program using predefined exceptions and create a user-defined exception, Implement an application where multiple exceptions are handled in a single try block	15
3	**Unit 3** Develop a Java GUI application with labels, buttons, and text fields using AWT, Implement an event-handling mechanism for button clicks and display an appropriate response, Create an application using checkbox, radio button, choice, and list components, Develop a menu-based application using AWT, Implement event handling using interfaces in AWT with different components	15
4	**Unit 4** Write a Java program to connect to a MySQL database using JDBC, Implement different JDBC drivers (Type-1, Type-2, Type-3, Type-4), Develop a program to insert, update, delete, and retrieve data from a database using Statement, Demonstrate the use of ResultSet (Read-only and Updatable), Implement PreparedStatement to securely execute queries and prevent SQL injection	15
Total Hours		**60**

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Textbook :

1 Java: The Complete Reference, Herbert Schildt, McGraw-Hill, 2021
2 Core Java Volume I – Fundamentals, Cay S. Horstmann, Pearson Education, 2022

References:

1 Effective Java, Effective Java, Joshua Bloch, Addison-Wesley, 2018
2 Head First Java, Head First Java, Kathy Sierra, Bert Bates, O'Reilly Media, 2005

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking / Creative**
20.00	30.00	25.00	15.00	10.00	0.00

Instructional Method:

1 Board Work
2 PPT
3 Demo

Supplementary Resources:

1 https://www.javatpoint.com/java-tutorial
2 https://stratoflow.com/use-of-java-in-software-development/
3 https://dev.java/learn/getting-started/
4 https://www.java.com/en/download/help/whatis_java.html
5 https://www.geeksforgeeks.org/java/java/
6 https://www.geeksforgeeks.org/java/java-programming-examples/

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