SUBJECT: COMPUTER SCIENCE							
SEC-4	**BCS-S604**	**Java Programming**	**L**	**T**	**P**	**C**	**Time for ESE**
			2	**-**	**-**	**2**	**3 Hrs.**

Pre- requisite: Knowledge of Object-Oriented Concepts through any programming language like C++.

Course Objectives:

- To understand the basic concepts and fundamentals of platform independent object-oriented language.
- To demonstrate skills in writing programs using exception handling techniques and multithreading.
- To understand streams and efficient user interface design techniques.

Course Outcomes:

CO1	Familiarize with the concept of Object-Oriented concepts by implementing Java Programming.
CO2	Learn the concepts of classes & objects with the features of reusability and implementation of the same with various control structures to solve real world problems.
CO3	Understand and design built-in and user defined functions/methods, interfaces and packages etc.
CO4	Handle various types of data using arrays & strings and handling of exceptions occurred in programs.
CO5	Utilize multithreading and applet features of Java for efficient and effective programming.
CO6	Create and handle files in Java.

Course Contents

UNIT	Contents	Lectures Required
1.	**Java Programming Fundamentals:** Introduction to Java, Stage for Java, Origin, Challenges of Java, Java Features, Java Program Development, Object Oriented Programming. Elements of Java Program, Java API, Variables and Literals, Primitive Data Types, The String class, Variables, Constants, Operators, Scope of Variables & Blocks, Types of Comment in Java. **Control Statements:** Decision making statements (if, if-else, nested if, else if ladder, switch, conditional operator), Looping statements (while, do-while, for, nested loops), Jumping statements (Break and Continue). **Classes and Objects:** Basic concepts of OOPS, Classes and Objects, Modifiers, Passing arguments, Constructors, Overloaded Constructors, Overloaded Operators, Static Class Members, Garbage Collection. **Inheritance:** Basics of inheritance, Inheriting and Overriding Superclass methods, Calling Superclass Constructor, Polymorphism, Abstract Classes, Final Class.	8
2.	**Arrays and Strings:** Introduction to array, Processing Array Contents, Passing array as argument, Returning array from methods, Array of objects,	8

	2D arrays, Array with three or more dimensions. String class, string concatenation, Comparing strings, Substring, Difference between String and String Buffer class, String Tokenizer class. **Interface and Packages:** Basics of interface, Multiple Interfaces, Multiple Inheritance Using Interface, Multilevel Interface, Packages, Create and Access Packages, Static Import and Package Class, Access Specifiers. **Exception Handling:** Introduction, Try and Catch Blocks, Multiple Catch, Nested Try, Finally, Throw Statement, Built-In Exceptions.	
3.	**Multithreading:** Introduction, Threads in Java, Thread Creation, Lifecycle of Thread, Joining a Thread, Thread Scheduler, Thread Priority, Thread Synchronization. **Applets:** Introduction, Applet Class, Applet Life Cycle, Graphics in Applet, Event-Handling.	8
	Total Lectures	24

Suggested Text Book(s):

1.	E. Balagurusamy, Programming with Java A Primer, 5th Edition, TMH.
2.	Sagayaraja, Denis, Karthik, Gajalakshmi, Java Programming for Core and Advanced Learners, Universities Press.

Suggested Reference Book(s):

1.	H. Schildt , Java, The complete Reference, TMH.
2.	H. Schildt, D. Skrien, Java Fundamentals, A Comprehensive Introduction, TMH.

Other Useful Resource(s)

1.	https://nptel.ac.in/courses/106105191
2.	https://archive.nptel.ac.in/courses/106/105/106105191/

Course Outcomes Contributed to Programme Outcomes

PO→ CO↓	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	AVERAGE
CO1	3	3	3	1	3	3	2	1	**2.4**
CO2	3	3	3	2	3	3	3	3	**2.9**
CO3	3	3	3	1	2	2	3	2	**2.4**
CO4	3	3	1	1	3	2	2	2	**2.1**
CO5	2	3	2	2	2	2	2	3	**2.3**
CO6	2	3	1	1	1	2	2	2	**1.8**
AVG.	**2.7**	**3.0**	**2.2**	**1.3**	**2.3**	**2.3**	**2.3**	**2.2**	**2.3**

Course Outcomes Contributed to Programme Specific Outcomes

PSO→ CO↓	PSO1	PSO2	PSO3	AVERAGE
CO1	3	3	2	**2.7**
CO2	2	3	3	**2.7**
CO3	2	3	3	**2.7**
CO4	2	3	3	**2.7**
CO5	3	3	3	**3.0**
CO6	2	3	2	**2.3**
AVG.	**2.3**	**3.0**	**2.7**	**2.7**