

Course code	Programming in Java	L	T	P	J	C
CSI1013		3	0	2	0	4
Pre-requisite	Nil	Syllabus version				
		v.1.0				
Course Objectives:						
1. Understand Object Oriented Programming & Functional Programming in Java, Handling Exceptions and Multithreading.						
2. Able to perform File Handling, Manipulating Strings, Generic Programming.						
3. Use of Java for Event Handling and Web applications using Servlets.						
Expected Course Outcome:						
At the end of this course students should be able to:						
1. Analyze the programs involving the fundamental program constructs.						
2. Choose the appropriate OOP technique for solving the real world problem.						
3. Demonstrate exception handling and use of threads in Java.						
4. Propose the use of Generic programming and file handling for different scenarios.						
5. Explore various methods for manipulating strings and several collections.						
6. Choose appropriate elements to facilitate event handling and GUI programming.						
7. Design and develop web applications using Servlets with JDBC.						
Student Learning Outcomes (SLO): 1, 9, 14						
1. Having an ability to apply mathematics and science in engineering applications						
9. Having problem solving ability, solving social issues and engineering problems						
14. Having an ability to design and conduct experiments, as well as to analyze and interpret data						
Module:1	Introduction to Java Programming	4 hours				
Overview of Java Language: Introduction, Java Virtual Machine, program structure, Java tokens, statements, variables, scope of variables and data types. Arrays: One-Dimensional arrays, Multidimensional Arrays.						
Module:2	Object, Class and Packages	7 hours				
Object Oriented Programming and Java –. Classes – Objects – Methods – Constructors – this keyword – Garbage collection – Overloading methods – Objects as parameters and returning objects – Nested and Inner classes – static and final keywords – Inheritance: Basics, Using super, Class hierarchy, Method overriding, Abstract classes – The Object Class – Packages and Interfaces.						
Module:3	Exceptions and Threads	7 hours				
Exception Handling: Fundamentals, Types, Uncaught Exceptions, Using try and catch, Multiple catch clauses, Nested try, Built-in Exceptions, Creating your own exception subclasses.						
Threads: Java thread model, Main thread, Creating a thread, Creating multiple threads, Thread priorities, Synchronization, Inter thread communication, Thread’s states, Multithreading.						
Module:4	Files and Generics	6 hours				
I/O streams – Console I/O – The PrintWriter class – Reading and Writing files. Generics: Basics, A Generic class, General form, Using wildcard arguments, Generic methods, Generic Interfaces, Generic Class hierarchy, Type inference.						
Module:5	Lambda Expressions and Strings	6 hours				

Lambda Expressions: Introduction, Block Lambda expressions, Passing Lambda expressions as arguments, Lambda Expressions and Exceptions. String Handling: The String Constructors, Various String Operations, StringBuffer and StringBuilder Classes.		
Module:6	Java Event Handling and GUI Programming	6 hours
Event Handling mechanism, Event Delegation, Event and KeyEvent Classes, EventListener Interfaces. GUI Programming with JavaFX: UI Controls, Layout Classes, Collection Classes, Media Classes.		
Module:7	Java Servlets and JDBC	7 hours
Background - Lifecycle of a servlet – Development – The Servlet API – The javax.servlet package – Reading Servlet Parameters - Handling http requests and responses – Using Cookies – Session Tracking – JDBC-Servlets with JDBC		
Module:8	Recent Trends	2 hours
	Total Lecture hours:	45 hours
Text Book(s)		
1.	Herbert Schildt, “Java: The Complete Reference”, , 11 th Edition., McGraw-Hill Publishers December 2018.	
2.	Cay S. Horstmann, “Core Java Volume I--Fundamentals”, 11 th Edition. , Pearson Publishers. August 2018.	
Reference Books		
1.	Ben Evans, David Flanagan, “Java in a Nutshell 7 th Edition., O'Reilly Media, Inc. December 2018.	
2.	Joshua Bloch, “Effective Java”.., 3 rd Edition. Addison Wesley Publishers December 2018	
Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar		
List of Experiments		
1.	Programs to demonstrate the use of arrays and various OOP concepts.	2 hours
2.	Programs to understand various exceptions and handling them.	2 hours
3.	Programs to demonstrate the concept of threads and multithreading in Java	2 hours
4.	Programs to understand Generic Programming technique and Lambda expressions.	4 hours
5.	Programs to create and manipulate file using different I/O methods.	4 hours
6.	Programs to explore various string handling methods.	3 hours
7.	Programs to idealize the use of different collection frameworks in java.util package and use of java.lang packages.	3 hours
8.	Programs to explore various swing elements to deepen the understanding of javaFX	3 hours
9.	Programs to realize the power of Java for internet programming through servlets.	3 hours
10.	Programs to realize the power of Java for internet programming through servlets with JDBC	4 hours
Total Laboratory Hours		30 hours
Mode of evaluation: CAT / Assignment / Quiz / FAT		
Recommended by Board of Studies		11-02-2021

Approved by Academic Council	No. 61	Date	18.02.2021
------------------------------	--------	------	------------